Origin of the Cenozoic Ignimbrite Flareup in the Southern Great Basin, western USA

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One of Earth's greatest manifestations of explosive magmatism was the middle Cenozoic ignimbrite flareup of southwestern North America. 36 to 18 Ma in the southern Great Basin, caldera-forming eruptions occurred on a high orogenic plateau where the crust was ~70 km. During this time, a subducting oceanic plate rolled back and steepened from its previous flat configuration. Huge amounts of basalt were produced in a short time and invaded the thick crust to drive production of >70,000 km^3 of explosively erupted silicic magma. More than 230 cooling units have been recognized in the province. The ignimbrites have initial Sr isotope ratios ranging from 0.706 to 0.712 and delta ^{18}O from 7 to 12 per mil, indicating incorporation of both mantle and crustal components. Higher Sr ratios in earlier erupted ignimbrites resulted from relatively more of the crustal component. *Rhyolitic magmas* were created by partial melting of the thick crust and variable hybridization with mantle-derived magmas or their differentiates. *Monotonous intermediates* were created in an exceptional burst of super-eruptions from 31.1 to 27.6 Ma resulting in four phenocryst-rich dacite ignimbrites with a total volume of about 17,000 km^3. Focused magma production may have resluted in diapiric ascent from a deeper MASH zone in the middle crust. An unuusal class of *trachydacitic tuffs* followed the monotonous intermediate burst. They are ferroan but possess negative Nb anomalies and other features typical of arc magmas. Magma genesis involved deep fractionation from andesitic parents with little contamination by crustal material, most of which had been effectively diluted or scavenged by earlier magmatism.